A Real Time Interface Between a Computerized Physician Order Entry System and the Computerized ICU Medication Administration Record

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ABSTRACT

Prior attempts to interface ICU Clinical Information Systems (CIS) to Pharmacy systems have been less than successful. The major problem is that in ICUs, medications frequently have to be administered and charted in the CIS Medication Administration Record (MAR) before pharmacists can enter them into the Pharmacy system. When the Pharmacy system belatedly sends medication orders to the CIS MAR, this may create duplicate entries for medications that ICU nurses have had to enter manually to chart doses actually given. The authors have implemented a real time interface between a Computerized Physician Order Entry (CPOE) system and a CIS operating in ten ICUs that solves this problem. The interface transfers new medication orders including order details and alerts directly to the CIS Medication Administration Record (MAR), where they are immediately available for nurse charting.

Methods: The Patient Care Expert (PCX) web-based CPOE system was developed at Cedars-Sinai Medical Center and interfaced to a CIS serving 133 beds in 10 ICUs (CareVue CIS, Philips Medical Systems, Andover, MA). The CPOE used an existing CIS interface specification available for Pharmacy systems. At other CIS sites Pharmacy interfaces had enjoyed limited success because in many cases, ICU nurses had to manually add drugs to the MAR to chart urgent and emergent doses. When physician orders were finally processed by the Pharmacy, the orders sent to the CIS were frequently posted on the MAR as duplicate entries, causing confusion in the medical record.

Although the PCX CPOE was interfaced to the hospital's Pharmacy system, for ICU patients all medication orders were transmitted to the CIS MAR. As soon as a physician authenticated orders with an electronic signature (Figure 1), all medication orders appeared in the CIS MAR, ready for the nurse to verify the orders and then chart doses. The medications shown in gray in Figure 2 are new automatic entries the nurse will authenticate with an electronic signature. Once authenticated, nurses may chart individual doses

Results: 40,170 ICU medication, IV infusion and IV drip orders were automatically transferred from the CPOE to ICU CIS MARs during three months of CPOE operation. The interface eliminated manual order transcription, medication entry errors and improved ICU nurse efficiency and satisfaction.
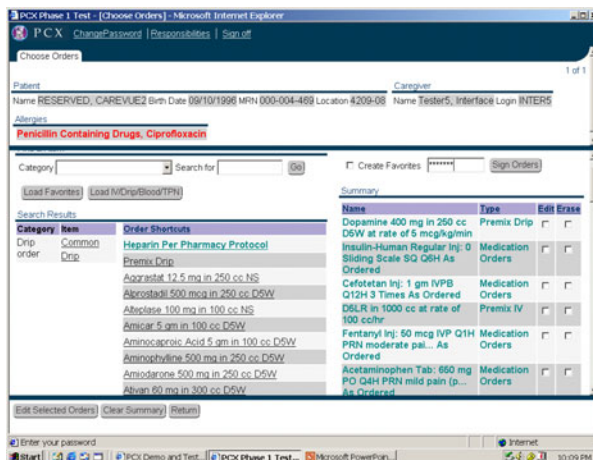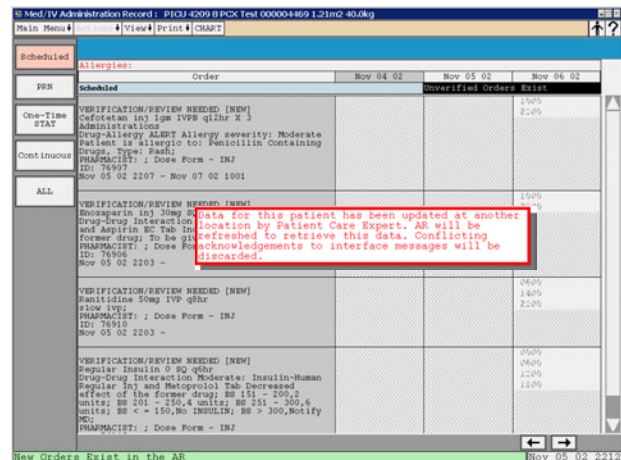

Figure 1. CPOE Signoff Screen

Figure 2. CIS MAR Verification Screen